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FOR THE MIDSOUTH

SOUTHERN FOREST EXPERIMENT STATION, FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE

Shaping Tomorrow's Trees

How do you want your trees? If you are a tree grower you probably want them to increase rapidly in height and diameter. You hope they will resist damage by insects and diseases. You think they should respond well to your forestry techniques, and you may want bountiful seed crops. You certainly want the stems to have a form favored by the wood manufacturers who are likely to buy them. In turn, wood manufacturers may want thin bark, strong wood, heavy wood, and long fibers. Some may want wood that has few knots.

Tree breeders can achieve any of these things, but they cannot efficiently achieve all of them at the same time. The tree breeder knows how to concentrate specific combinations of desirable traits into a few parents, which will supply seeds for large reforestation projects. From a given

Tree in photo below inherited a desirable tendency for branches to join the trunk at right angles, forming small knots.



amount of effort he can make large improvements in a few traits or small improvements in many traits.

The complete list of traits breeders know they can alter is large and growing. Before he can do a good job, the breeder must know what characters tree growers want changed and how badly they want the changes. What is more, a breeder must know what tree growers are likely to want 25 to 40 years from now, not what they want now. That much time will be needed for the improved trees to be bred and reach maturity.

The problems associated with choosing traits and planning a breeding program are discussed in a recent JOURNAL OF FORESTRY article, "Tree Breeding and Management Decisions." Copies of the article are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.



Controlled pollination brings together parents that possess one or more desirable traits.

More low-quality wood will grow at the base of the upward trending branches of tree in photo below.



Fire Prevention A Stepchild?

In recent years the average size of forest fires in the United States has been declining—an indication that fires are being put out with increasing efficiency. Meanwhile, the number of forest fires per year, an index of success in prevention, has been rising for more than a decade. M. J. Dixon, leader of the Forest Fire Prevention Research Project at the Southern Forest Experiment Station, attributes the unimpressive prevention record to neglect of programs designed for individual communities.

In an article in *FOREST FARMER* magazine, Dixon says that national and regional advertising programs are working well. He thinks, however, that many local prevention programs exist on paper only. Thus, there is little effort to change people's atti-

tudes by meeting them individually.

In visits to forest protection agencies Dixon believes he has detected a lack of enthusiasm for prevention work. "Top managers in these organizations are reluctant to participate in prevention programs, very probably because they regard the work as having relatively low priority."

In the South, where incendiarism and debris burning are major problems, Dixon says that some well planned and well funded local programs have been highly successful. He thinks such programs can save both money and forest resources. Copies of his article are available on request from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.

Researcher M. J. Dixon (right) attributes an increase in numbers of forest fires to neglect of local prevention programs.



AIR POLLUTION AND TREES

Plant injury by air pollution has been recognized by forest scientists since the early 1900's. In the new era of concern for environment—the 1970's—the matter has received widespread public attention.

The decline of ponderosa pine in the San Bernardino Mountains in California is blamed on the Los Angeles smog.

A major cause of plant injury is sulfur dioxide, which is released into the air by coal burning. Sulfur dioxide enters plant leaves along with normal air components and reacts with cells of the leaf tissue. Symptoms may be either chronic or acute, depending on the extent of injury.

Fluoride injury to plants became widespread after World War II when the aluminum industry and other manufacturing processes emitting fluorides made rapid growth. While recently installed controls in these industries have greatly reduced fluoride output, localized problems still exist where controls are lax.

Symptoms of damage to trees by these and other common sources of air pollution are described and illustrated with color photographs in a new 12-page booklet entitled "Air Pollution and Trees." The information was assembled by Dr. Donald D. Davis, air pollution specialist for the Southeastern Area of State and Private Forestry, USDA Forest Service, Atlanta, Georgia. Copies are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.

Wildlife Habitat Laboratory Dedicated

Meeting the needs of future generations and at the same time adding to the beauty and bounty of the forest were described as aims of USDA Forest Service research as a new laboratory was dedicated at Nacogdoches, Texas, October 22. Senator John G. Tower was the principal speaker at the program officially opening the Wildlife Habitat and Silviculture Laboratory, one of 12 research facilities of the Southern Forest Experiment Station.

"We should not be so concerned with the vexing problems of this generation that we fail to look after coming generations," Senator Tower said. Consumption of timber and timber products will double in the years ahead, and southern forests will be expected to produce half of the amount likely to be required, he stated. "Forests must be managed to extract not only the timber crop, but also other benefits."

The Nacogdoches laboratory, located on the campus of Stephen F. Austin State University, is the only Southern Station research installation primarily concerned with growing wildlife in timber-producing lands of the South.

More than 300 persons attended the dedication. John R. McGuire, Associate Chief of the Forest Service, Washington, D. C., declared the laboratory officially open. Southern Station Director Robert L. Youngs was master of ceremonies. The guests included Dr. Ralph W.



Open house was held at the Wildlife and Silviculture Laboratory at Nacogdoches, Texas, following dedication of the new Southern Forest Experiment Station research facility. Left to right are R. L. Youngs, Director of the Southern Station; John G. Tower, U. S. Senator from Texas; and V. L. Duvall, Assistant Director of the Southern Station, Forest Environment and Genetics Research.



The new Wildlife and Silviculture Laboratory occupies a 1.5-acre site on the Stephen F. Austin State University campus.

Steen, President of Stephen F. Austin State University; E. R. Wagoner, Executive Vice-President of the Texas Forestry Association; W. Caleb Glazener, Assistant Director of the Welder Wildlife Foundation, and Otis Lock, Vice President of Southland Paper Mills, Inc., who introduced Senator Tower. The Reverend Don Brice, Pastor of the First Christian Church, Nacogdoches, gave the invocation.

The new 10,000-square foot laboratory occupies a 1.5-acre

site and has facilities for 11 scientists and six supporting personnel. Lowell K. Halls is project leader in wildlife habitat research, and J. J. Stransky heads up the timber management research.

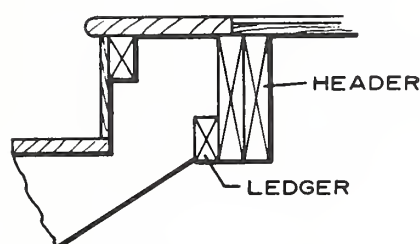
The Southern Station's research at Nacogdoches began in 1944 when Congress set aside the Stephen F. Austin Experimental Forest. Early studies revealed some basic requirements

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Helpful Handbook For Home Builders

Whether you intend to build your own house, or want to keep an eye on the guy who does, or plan to buy a completed house and need pointers on judging its construction, there's a manual chock-full of assistance.

It's called "Wood-frame House Construction," and is the newest revision of USDA Agriculture Handbook 73. The author is L. O. Anderson of the Forest Products Laboratory at Madison, Wisconsin.



Basement stairs, showing ledger for carriage.

"The modern conventional wood-frame house, with wood or wood product covering materials, is economical, long lasting, and can be constructed in any location," says Anderson. "However, to provide this efficient wood house, good construction details are important as well as the selection of materials for each specific use."

In plain words backed up with numerous excellent drawings, the author then proceeds to de-

scribe what the Forest Products Laboratory considers to be acceptable construction practices. The order of presentation follows the normal sequence in building—from foundation to finish work. Final chapters add information on painting, on maintenance and repair, and on protecting wood from decay, termites, and fire.

Copies of the 223-page handbook are available for \$2.25 from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

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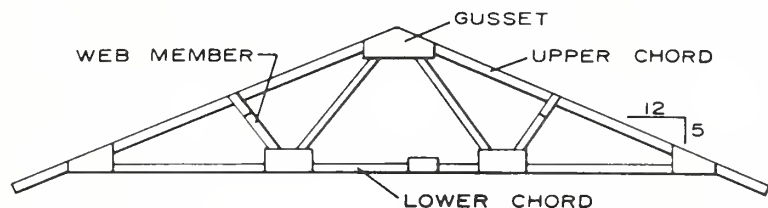
Gable roof.

LABORATORY SITE SELECTED

A 6-acre site at Auburn University campus in Alabama has been selected as the location for a new laboratory to house the Southern Forest Experiment Station's forest engineering and silvicultural research. The announcement was made by Dr. R. L. Youngs, Southern Station Director, and Auburn University President Dr. Harry M. Philpott.

The proposed \$1 million laboratory building, which will be constructed when funds become available, will occupy part of an area where the Auburn forestry staff have since 1927 had experimental plantings of southern pines, plus some hybrids. Data collection from these plantings has been completed, Dr. Youngs said, and it is significant that the site will continue to be used for forest research.

Southern Station forest engineering research is now housed in the Agricultural Engineering Building of Auburn University. The silvicultural research unit which will occupy the new building is at Brewton, Alabama.



Light wood truss, W-type.

Where the Wild Game Goes

Wild game thrives where it finds food and cover. Well over a dozen important species ranging from black bear to Wilson's snipe call the 200 million acres of southern forests home.

An "Atlas of Southern Forest Game" recently published by the Southern Forest Experiment Station of USDA's Forest Service is packed with information about game populations. It shows where game kills are highest, tabulates populations by State, maps locations of public hunting areas, and discusses habitat requirements and possible habitat improvements. Two page-size maps summarize kill of deer and turkey by county. Smaller maps show the southern ranges of major game animals and birds.



The southern population of white-tailed deer has nearly doubled every 10 years since the late 1930's. The current population is estimated at 3 million, and the trend in most States continues upward. On the other hand, squirrels, also popular with the hunter, have experienced hard times with loss of habitat.

The compilation, the first of its kind to be attempted, was prepared by Lowell K. Halls and John J. Stransky of the Southern Station's Wildlife Habitat and Silviculture Laboratory at

Nacogdoches, Texas. Statistics on game kills and populations and estimates of trends were provided by the game departments of 12 Southern States, and also by the Fish and Wildlife Service, U. S. Department of the Interior.

Game distribution and abundance are closely related to the five major forest types in the South. The oak-gum-cypress forests of the river bottom lands have a high potential for most game species by virtue of fertile soils, high-quality forage, wide variety of mast trees, and availability of water. During the past 30 years clearing for farming and reservoirs has critically reduced the acreage of this prime game habitat. The 38 million acres still remaining comprise about 19 percent of the total southern forest acreage.

The oak-pine and oak-hickory types together comprise 40 percent of the total forest area, mostly in the western and northern portions of the region. When mast yields are good, these upland types have a high potential for game.

Loblolly and shortleaf pines, intermixed with many hardwoods, make up about one-fourth of the forest acreage. For best habitat here, trees should be spaced widely and thinned regularly. Cutting units should be kept small and strategically located, mast-bearing hardwoods retained, and pine stands prescribe-burned every 3 to 5 years.

Similar management is desirable in the longleaf-slash pine type of the Lower Coastal Plain, which occupies about 13 percent



of the total area. Unless pine stands are very dense, this type is especially attractive to upland game birds.

Copies of the 24-page atlas may be had from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.

Wildlife Lab., Cont'd from P. 3

for regenerating pines on difficult sites and provided information on the life history and seasonal behavior of the southern pine beetle and its predators.

In 1961 the program was re-oriented to include forest wildlife habitat research as its major function. Since then the researchers have published nearly 100 papers on the southern forest's potential to produce food and cover for such species as white-tailed deer, squirrels, bobwhite quail, and turkeys.

Research at the Nacogdoches laboratory is a team effort. In addition to Forest Service personnel it includes scientists from the Texas Parks and Wildlife Department; the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service; and Stephen F. Austin State University. Other State game and fish departments, universities, and private industry also cooperate.

Weather Forecast:

SEVERE RUST

Think it'll rain?

A forest nurseryman asking the question is probably not wondering whether to carry an umbrella. More likely, he's trying to decide if he ought to spray his pine seedlings to protect them from fusiform rust, the most serious disease of southern pines.

Caused by the fungus *Cronartium fusiforme*, the disease begins with telia on oak leaves. The telia produce basidiospores, which are carried by the wind to infect pine trees. Spores are released in greatest abundance and survive best during periods of mild, moist weather, especially when rains occur during the late afternoon or early evening. Spore flights are most numerous in April, May, and June.

To keep infection down, nurserymen spray the seedlings at regular intervals. Nevertheless, many seedlings are still lost—in some years 15 to 20 percent. Much of the infection occurs on stem and needle tissue that the rapidly growing seedlings put forth between sprayings.

Southern Forest Experiment Station researchers have found that conditions of severe rust hazard can be forecast with great accuracy, and that periods of moderate hazard can usually be predicted. With such forecasts, nurserymen can reduce losses considerably by applying reinforcement sprays.

This year several nurseries in Mississippi are receiving "rust forecasts" from Leonard Waas, forestry meteorologist at the Na-



A method of predicting rust-favoring weather enables southern nurserymen to ward off the South's worst pine seedling disease.

tional Weather Service in Jackson. They claim considerable progress in keeping ahead of the rust.

Several years of work by Dr. Glenn A. Snow at the Southern Station's Gulfport laboratory preceded trials with nurserymen. He designed laboratory apparatus to study the telia, production of the basidiospores, and their journey through moist air to tiny pine trees. He also kept precise records on the whole process under natural conditions of temperature and humidity.

With the knowledge thus gained, he ran a test cooperating with three nurseries and forestry meteorologist R. T. Davis. Twice during the April-May-June test period, weather conditions favorable to rust were pre-

dicted. Nurserymen heeded the warning with reinforcement spraying.

Results of the test confirmed that "rust weather" can be forecast with accuracy. By working with the weatherman, nurserymen can pinpoint days when reinforcement sprays should be applied. "We don't have to be in the dark anymore," they tell Snow.

An account of the Davis-Snow test appears in *TREE PLANTERS' NOTES*, and copies may be had on request to the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. Also available are four reprints describing Snow's detailed research on the production and distribution of spores.

Florida's Timber Supply Shows 20 Percent Increase

Volume of growing-stock timber in Florida has increased from 9.1 to 10.9 billion cubic feet, or 20 percent, since 1959. This was revealed in a statewide survey published by the Southeastern Forest Experiment Station at Asheville, North Carolina. Almost four-fifths of the increase has been in softwood, primarily southern pine. Slash pine is the predominant species in Florida and makes up almost one-fourth of the inventory.

While timber inventory was expanding, area of commercial forest land was shrinking. Almost a million acres have been diverted from forest land to citrus groves, pasture, other agricultural activity, or urban development.

One of the Nation's most extensive reforestation efforts has been in Florida. Since 1959 about 2 million acres have been planted or seeded, mostly to pine.

The report shows that forest industry owns almost one-third of the commercial forest land, and that another 13 percent is publicly owned. The remaining 8.9 million acres, or 55 percent, are owned by private individuals and corporations.

Pulpwood is the leading timber product, and volume harvested has increased almost 2½ times since 1950. A decline in the cut of saw logs apparently ended in the early sixties, and output of saw logs is now also trending upward. Florida's first and only pine plywood plant began operations at Chiefland in 1967.

In spite of the improvement measured in Florida's timber, the report identifies several deficiencies in timber supply and use. About 7.4 million acres either have no stocking at all or are occupied by rough and rotten trees or other inhibiting vegetation. On about



One of the Nation's most extensive reforestation efforts has been in Florida. Since 1959 about 2 million acres have been planted or seeded, mostly to pine. (Division of Forestry, Florida Department of Agriculture and Consumer Services Photo)



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Typical fusiform rust galls on branches of slash pine.

A CRITICAL REVIEW

Want to find out what's known about fusiform rust, the worst disease of southern pine trees?

A lot of forest scientists have done a lot of research, and the subject is far from closed. More than 400 publications describe the findings of over 200 researchers.

Fusiform rust in southern pines, caused by *Cronartium fusiforme*, is widely distributed from the eastern shore of Maryland to Florida, Texas, and southeast Arkansas. It is a major obstacle to management of slash and loblolly pine plantations, and may cause catastrophic losses of nursery seedlings unless intensive control measures are taken.

To find out how things stand, read "Fusiform Rust of Southern Pines—A Critical Review" by Felix J. Czapator. In addition to an exhaustive survey of literature on the subject, the booklet notes major current research, published with the hope of facilitating research leading to eventual control of the disease.

Copies are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. Ask for Research Paper SO-65.

"Give a Hoot—Don't Pollute"

That's the theme Woodsy Owl recently began promoting.

Woodsy is a new animal symbol adopted by the USDA Forest Service to fight pollution, just as Smokey Bear has promoted forest fire prevention.



Long an advocate of measures to protect environment, the Forest Service hopes with the help of Woodsy Owl to make people as aware of the ways they can prevent pollution as they are of how to prevent forest fires.

Children at summer camps, schools, playgrounds and parks in the Los Angeles area chose Woodsy Owl as their favorite candidate to carry the anti-pollution banner. The new Forest Service crusader will give advice on protecting the soil, air, water, and plant life; cutting down on unnecessary noise; and controlling vandalism and destruction in the Nation's out-of-doors.

Florida, Cont'd from P. 7

4 million acres in this condition, work needs to be done to remove unwanted vegetation before regeneration can go ahead.

The Florida survey was conducted by the Southeastern Station in cooperation with the Division of Forestry, Florida Department of Agriculture and Consumer Services. Authors of the report are Herbert A. Knight and Joe P. McClure. Copies are available from the Southeastern Forest Experiment Station, USDA Forest Service, P. O. Box 2570, Asheville, N. C. 28802. Separate reports are also available for Northeast, Northwest, South, and Central Florida.